
टेपर पाइप के चूड़ियों के लिए
रैचेट पाइप थ्रेडर की विशिष्टि
(आर-सीरीज)

Ratchet Pipe Threader for Taper
Pipe Threads (R-Series) —
Specification

ICS 25.100.50

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भारतीय मानक ब्यूरो

BUREAU OF INDIAN STANDARDS

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FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards after the draft finalized by the Cutting Tools Sectional Committee had been approved by the Production and General Engineering Division Council.

The standard has been prepared by the sectional committee based on the inputs provided by the members as per the industry practices.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off values should be the same as that of the specified value in this standard.

Indian Standard

RATCHET PIPE THREADER FOR TAPER PIPE THREADS (R-SERIES) — SPECIFICATION

1 SCOPE

This standard specifies the requirements of ratchet pipe threader used as plumbing tool to cut taper external pipe threads (R-Series) on pipes according to IS 554.

2 REFERENCES

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below.

<i>IS No.</i>	<i>Title</i>
210 : 2009	Grey iron castings — Specification (<i>fifth revision</i>)
513 : 2008	Cold reduced low carbon steel sheet and strip (<i>fifth revision</i>)
554 : 1999/ ISO 7-1 : 1994	Pipe threads where pressure-tight joints are made on the threads — Dimensions, tolerances and designation (<i>fourth revision</i>)
1239 (Part 1) : 2004	Steel tubes, tubulars and other wrought steel fittings — Specification: Part 1 Steel tubes (<i>sixth revision</i>)
1570 (Part 2/ Sec 1) : 1979	Schedule of wrought steels: Part 2 Carbon steels (unalloyed steels), Section 1 Wrought products (other than wires) with specified chemical composition and related properties (<i>first revision</i>)
1865 : 1991	Iron castings with spheroidal or nodular graphite — Specification (<i>third revision</i>)
2500 (Part 1) : 2000/ ISO 2859-1 : 1999	Sampling procedure for inspection by attributes: Part 1 Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection (<i>third revision</i>)
3748 : 1990	Tool and die steels — Specification (<i>second revision</i>)

IS No.

Title

7291 : 1981	Specification for high speed tool steels (<i>first revision</i>)
7778 (Part 4) : 2003	Small tools sampling inspection procedures: Part 4 Screwing taps, dies and knurling tools (<i>first revision</i>)
10748 : 2004	Hot-rolled steel strip for welded tubes and pipes — Specification (<i>second revision</i>)

3 CONSTRUCTION

Ratchet pipe threader consists of two sub-assemblies, namely die head and ratchet handle. Die head consists of a set of threading chasers firmly held in a body and retained by a cup. The die head body is octagonal or ribbed or geared in shape on one side to fit into its counterpart in ratchet handle. The ratchet handle consists of a body (to hold the die head) and a ratchet mechanism to rotate it (for threading purpose) through an angle as desired by the operator and relieve the die when rotated in reverse direction. The direction of engaging and relieving of ratchet mechanism can be reversed for the purpose of unscrewing of die from the pipe after threading.

4 SIZES, SHAPES AND DIMENSIONS

4.1 Ratchet pipe threader is designated by the nominal size of the pipe threads it is designed to cut on pipe. The sizes covered in this standard are ½, ¾, 1, 1¼, 1½, 2, 2½, 3, 4, 5 and 6.

4.2 Typical arrangement of die head is shown in Fig. 1 to Fig. 3. Dimensions of die head are given in Table 1.

4.3 The dimensions of chasers are given in Table 2 read with Fig. 4.

4.4 Typical arrangement of ratchet handle is shown in Fig. 5 to Fig. 8. Dimensions of ratchet are given in Table 3. Typical arrangement of lever of ratchet handle is given in Fig. 9.

5 MATERIALS

5.1 The materials for construction of die head and ratchet handle shall conform to the respective grades given in Table 4.

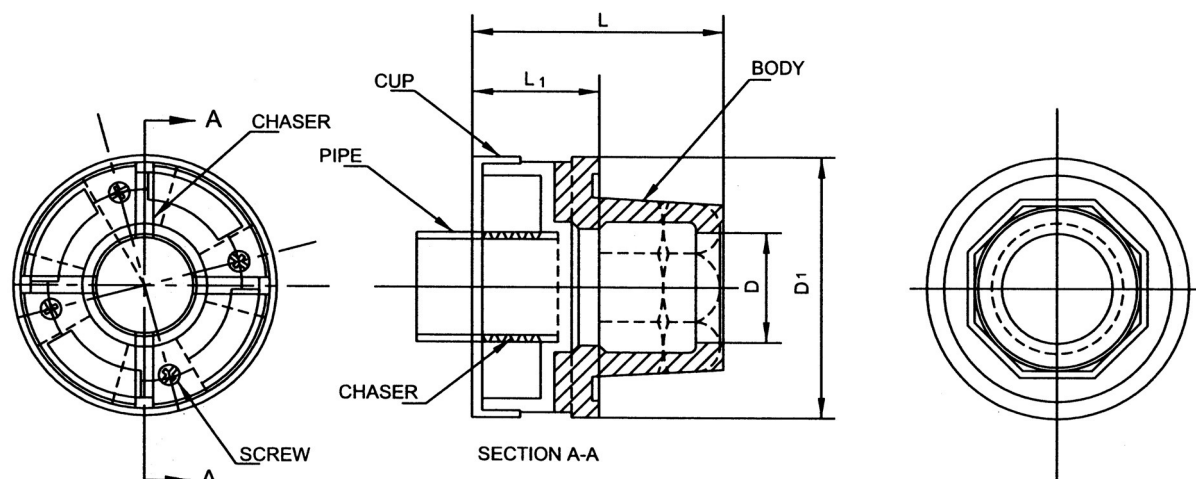
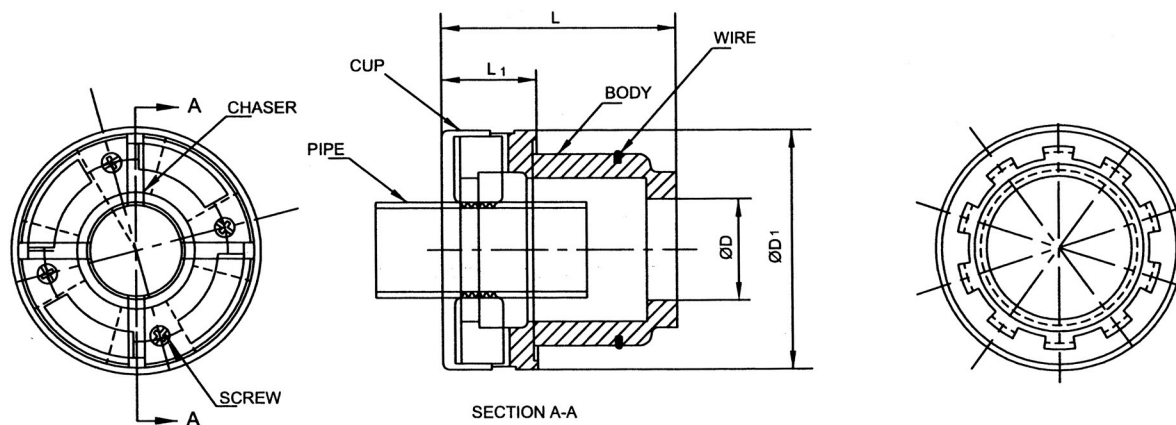
FIG. 1 SHAPE OF DIE HEAD OF SIZE $\frac{1}{2}$ TO 1FIG. 2 SHAPE OF DIE HEAD OF SIZE $1\frac{1}{4}$ TO 2

Table 1 Dimension of Die Head
(Clause 4.2)

Nominal Size	D mm Min	D-1 mm Max	L mm Approx	L-1 mm Approx
$\frac{1}{2}$	21.5	73	65	30
$\frac{3}{4}$	27.0	73	65	30
1	33.7	82	70	35
$1\frac{1}{4}$	42.5	105	100	35
$1\frac{1}{2}$	48.5	105	100	35
2	60.7	115	100	35
$2\frac{1}{2}$	76.5	165	120	50
3	89.5	175	120	55
4	115.5	195	150	60
5	141.3	250	155	60
6	166.5	260	155	60

Table 2 Dimension of Chaser
(Clauses 4.3 and 6.3)

Nominal Size	Threads in 25.4 mm	No. of Chasers	<i>T</i> mm <i>Min</i>	<i>H</i> mm <i>Max</i>
½	14	4	5.3	20.0
¾	14	4	5.3	20.0
1	11	4	5.3	25.0
1 ¼	11	4	9.3	25.0
1 ½	11	4	9.3	25.0
2	11	4	9.3	30.0
2 ½	11	6	9.3	35.0
3	11	6	9.3	38.0
4	11	6	9.3	47.0
5	11	6	9.3	50.0
6	11	6	9.3	50.0

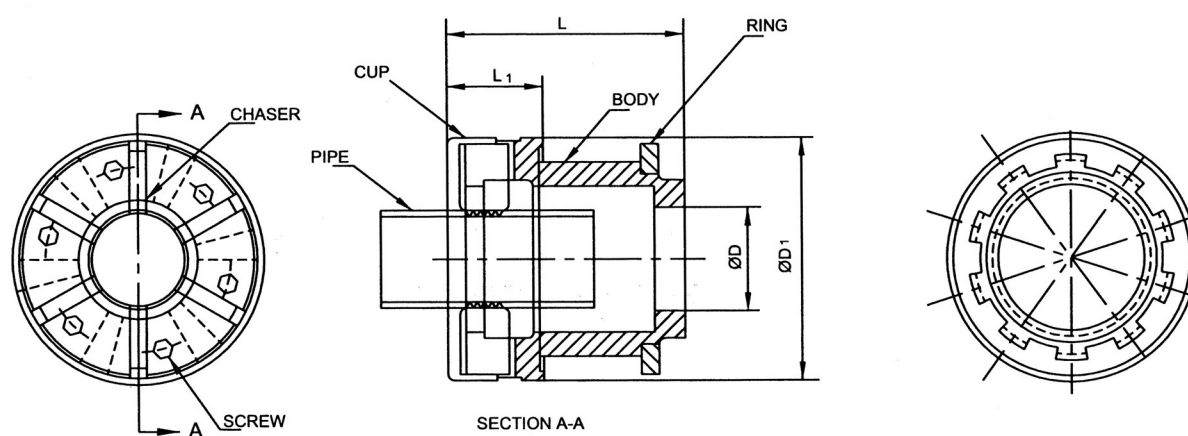


FIG. 3 SHAPE OF DIE HEAD OF SIZE 2½ TO 6

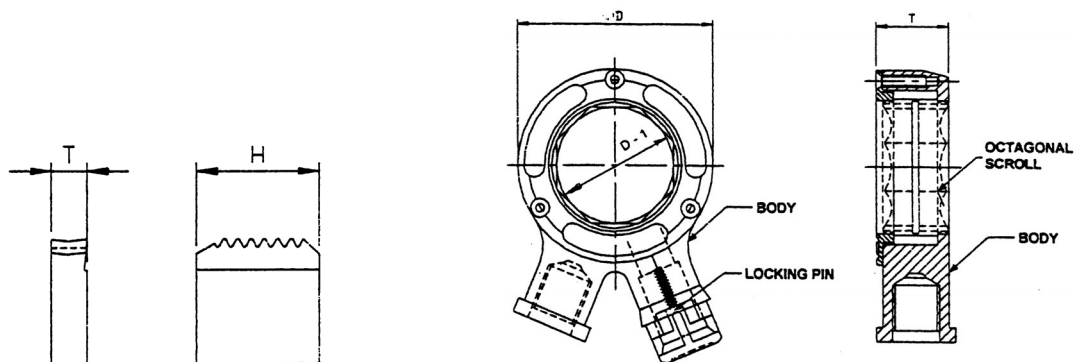


FIG. 4 CHASER

FIG. 5 SHAPE OF RATCHET HANDLE FOR SIZE ½ TO 1

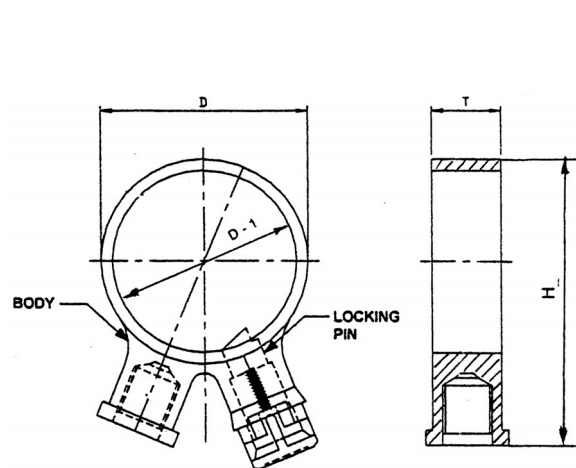
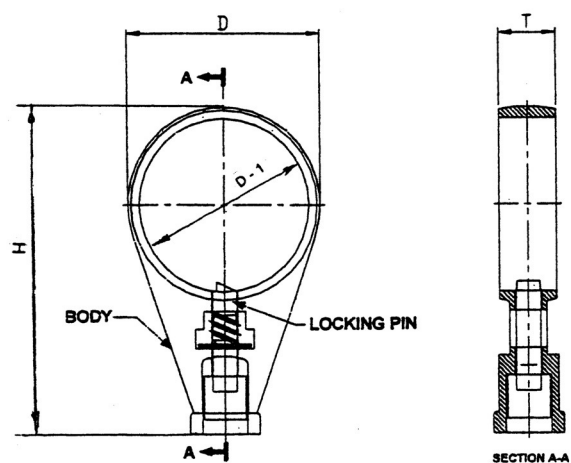
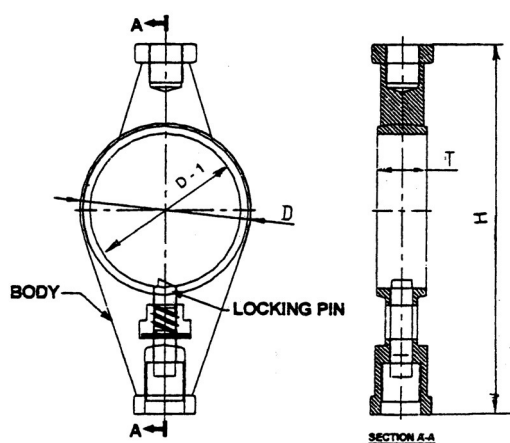
FIG. 6 SHAPE OF RATCHET HANDLE FOR SIZE $1\frac{1}{4}$ TO 2FIG. 7 SHAPE OF RATCHET HANDLE FOR SIZE $2\frac{1}{2}$ TO 4

FIG. 8 SHAPE OF RATCHET HANDLE FOR SIZE 5 TO 6

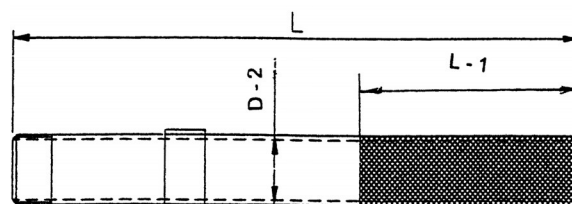


FIG. 9 LEVER OF RATCHET HANDLE

Table 3 Dimensions of Ratchet Handle
(Clause 4.4)

Nominal Size	Ratchet Handle				Lever of Handle		
	D mm Max	D-1 mm Min	T mm Approx	H mm Min	D-2 mm Approx	L mm Approx	L-1 mm
$\frac{1}{2}$, $\frac{3}{4}$, 1	95	55 (A/F)	32	125	21	455	130
$1\frac{1}{4}$, $1\frac{1}{2}$, 2	115	95	40	155	26	470	135
$2\frac{1}{2}$, 3	160	140	40	275	33	765	185
4	186	166	50	310	41	910	190
5, 6 ¹⁾	257	225	50	450	41	910	190
5, 6 ¹⁾	—	—	—	—	33	765	185

¹⁾ Two levers are with 5 and 6 size handle.

NOTE — Dimension L-1 is for knurling or soft grip.

Table 4 Materials for Construction of Ratchet Pipe Threader
(Clause 5.1)

Component	Material
Die Head Body & Ratchet Handle Body	Cast iron of Grade FG 200 as per IS 210
Cup	or Grade SG 450/10 or Grade SG 500/7 as per IS 1865 Grade SG 450/10 or Grade SG 500/7 as per IS 1865
Chaser	or Grade 1 or Grade 2 as per IS 10748 or Grade CR1 or Grade CR2 or Grade CR3 as per IS 513 Designation T90Mn6WCr2 or Designation XT160Cr12 or Designation XT215Cr12 of Tool and die steel as per IS 3748 or Grade designation XT72W18Cr4V1 or Grade designation XT87W6Mo5Cr4V2 or Grade designation XT90W6CoMo5Cr4V2 of High speed tool steel as per IS 7291
Locking Pin	Designation 40C8 or Designation 45C8 of Carbon Steel as per IS 1570 (Part 2/Sec1)

NOTE — Unless other wise specified chaser material shall be Grade XT160Cr12 for carbon steel pipes and Grade XT87W6Mo5Cr4V2 for stainless steel pipes.

6 MANUFACTURE

6.1 The die head shall consist of a set of threading chaser firmly held in a body and retained by a cup.

6.2 Chaser

The chaser shall be a minimum of 4 pieces set in sizes of $\frac{1}{2}$ to 2 die head and a minimum of 6 pieces set in $\frac{1}{2}$ to 6 die head. The hardness of chasers measured on face near to the cutting edge shall be between 653 HV to 746 HV (58 — 62 HRC) for carbon tool steel and 760 HV to 900 HV (62.5 — 67 HRC) for high speed steel. The dimensions of chasers shall be such as to provide threads conforming to IS 554 (R-Series). The rake angle of chasers shall be ground. The method of fitting chaser set is illustrated in Fig. 10.

6.3 Ratchet Handle

The ratchet handle shall consist of a body and a locking pin for ratchet action, by which the die head is rotated in both direction by rotating the locking pin 180° . It shall be possible to cut threads on the pipe by rotating the ratchet handle through an angle of not more than 60° in one stroke. It shall be possible to fit any die head of a particular size into the ratchet handle of the same size produced by the same manufacturer. The length of the lever is guided as per Table 2.

7 WORKMANSHIP AND FINISH

7.1 The body and other casting parts shall be soundly caste and free from cracks, burrs, seams blow holes and other defects. All surfaces shall be finished smooth and suitably protected against rust.

7.2 The cutting edge of chaser shall be ground readily for immediate use.

7.3 The machined surface shall be protected by any rust preventive treatment.

8 SAMPLING

8.1 The Criteria for drawl of samples for the testing and acceptance criteria shall be as per IS 7778 (Part 4).

8.2 For dimensions and manufacture, workmanship and finish, the sampling plan with inspection level III and acceptance quality level 4.0 percent as given in Table 1 and Table 2 of IS 2500 (Part 1) shall be followed.

8.3 For hardness and tests, the sampling plan with inspection level 1 and acceptable quality level 2.5 percent as given in Table 1 and Table 2 of IS 2500 (Part 1) shall be followed.

9 TESTING

9.1 The dimensions shall be physically inspected according to the sampling plan. Performance and

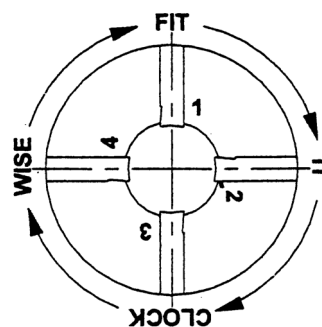


FIG. 10 FITTING METHOD OF CHASER SET

IS 16176 : 2014

Threads shall be inspected by cutting threads on a pipe. The thread shall be taper thread.

9.2 Ratchet pipe threader shall be capable of cutting thread on a pipe conforming to IS 1239 (Part 1).

9.3 The length of useful external thread shall not be less than that given in Table 5.

9.4 The threads cut shall meet the gauging requirements as per IS 554 (R-Series).

9.5 After threading the pipe, the threads of the chasers shall not show any rupture or blunting and the same shall be observed under a microscope.

10 MARKING

10.1 The ratchet pipe threader shall be marked with manufacture's name or trade mark and nominal size.

10.2 BIS Certification Marking

10.2.1 The product may also be marked with Standard Mark.

10.2.2 The use of Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the license for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

11 PACKING

The ratchet pipe threader shall be coated with a suitable rust proofing material before delivery. The ratchet pipe threader shall be packed in a suitable carton bearing the manufacturer's name, or trade mark and the range of die sizes.

Table 5 Length of External Threads
(Clause 9.3)

Nominal Size	½	¾	1	1¼	1½	2	2½	3	4	5	6
Minimum Gauge Length, mm	11.4	12.7	14.5	16.8	16.8	21.1	23.2	26.3	32.3	36.6	36.6

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

This Indian Standard has been developed from Doc No.: PGD 32 (1170).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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AMENDMENT NO. 1 OCTOBER 2014
TO
IS 16176 : 2014 RATCHET PIPE THREADER FOR TAPER PIPE THREADS
(R-SERIES) — SPECIFICATION

(Page 4, Table 3) — Substitute the following for the existing table:

Table 3 Dimensions of Ratchet Handle

(Clause 4.4)

Nominal Size (1)	Ratchet Handle				Lever of Handle		
	<i>D</i> mm <i>Max</i>	<i>D-1</i> mm <i>Max</i>	<i>T</i> mm <i>Min</i>	<i>H</i> mm Approx	<i>D-2</i> mm <i>Min</i>	<i>L</i> mm Approx	<i>L-1</i> mm Approx
	(2)	(3)	(4)	(5)	(6)	(7)	(8)
½, ¾, 1	95	55 (A/F)	32	125	21	455	130
1¼, 1½, 2	115	95	40	155	26	470	135
2½, 3	160	140	40	275	33	765	185
4	186	166	50	310	41	910	190
5, 6 ¹⁾	257	225	50	450	41	910	190
5, 6 ¹⁾	—	—	—	—	33	765	185

¹⁾ Two levers are with 5 and 6 size handle.

NOTE — Dimension *L-1* is for knurling or soft grip.